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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,869	07/09/2003	Sandeep Gulati	18329-008001	1459

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EXAMINER	
SKIBINSKY, ANNA	

ART UNIT	PAPER NUMBER
1631	

NOTIFICATION DATE	DELIVERY MODE
02/26/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No.	Applicant(s)	
	10/616,869	GULATI, SANDEEP	
	Examiner	Art Unit	
	ANNA SKIBINSKY	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-10,12,13 and 16-65* is/are pending in the application.

4a) Of the above claim(s) *19-63* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-10,12,13,16-18,64 and 65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Amendments to claim 1 are acknowledged. Claims 1-6, 8-10, 12, 13, 16-18 and 64-65 are under examination.

Claims 19-63 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group and species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/5/2007.

Claims 7, 11, 14 and 15 are cancelled.

Priority

Applicant's claim of priority to US Patent 6,136,541, PCT/US00/04076, and US Patent 6,671,625 is denied because support for the limitation of converting an input signal from the spatial domain to the spectral domain for active interferometric analysis are not found therein. Furthermore, support for an expressor function in a spectral domain is also not found therein.

Claim Rejections - 35 USC § 112-2nd paragraph

1. The instant rejection is maintained from the previous Office Action.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-6, 8-10, 12, 13, 16-18 and 64-65 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim recites “performing active interferometric analysis on the received input signal using an expressor function in a spectral domain". It is unclear if Applicant intend to recite that the input signal is in the spectral domain or if the expressor function is in the spectral domain.

Claim Rejections - 35 USC § 103

5. The instant rejection is maintained from the previous Office Action.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.Determining the scope and contents of the prior art.

2.Ascertaining the differences between the prior art and the claims at issue.

3.Resolving the level of ordinary skill in the pertinent art.

4.Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-6, 8-10, 12, 13, 16-18 and 64-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gulati et al. (US Patent 6,136,541, issued 10/24/2000) in view of Cabib et al. (US Patent 6,088,099 issued 7/11/2000).

6. The instant claims are directed to a system processor which receives an arrayed signal pattern in the spatial generated from a microarray, wherein the signal is transformed into the spectral domain and interferometric analysis is performed on the received input signal using an expressor function in a spectral domain to determine an event of interest.

7. Gulati teaches analyzing hybridized biochip patterns and mutations of interest (col. 8, lines 37-39) (i.e. events of interest) using resonance interactions employing an expressor function as applied to DNA, RNA and peptide nucleic acid microarrays (i.e.device as listed in claim 1)(Abstract).

8. Gulati teaches analyzing an output pattern of a biochip (col. 4, lines 31-43)(i.e. receiving an arrayed signal pattern) and applying a dot spectrogram to the quantum

expressor function via an interferometric resonance interaction (i.e. interferometric analysis using an expressor function)(col. 8, lines 25-33). The arrayed pattern may be digitized from an illuminated fluorescent microarray or a photograph of the fluorescent pattern. The digitized pattern, i.e. "dot spectrogram" produced identifies locations where bonding in the DNA sample has occurred (i.e. input signal in the spatial domain)(col. 3, lines 21-30). The "dot spectrogram" is further analyzed using interferometric analysis, as in claim 1.

9. Gulati teaches coupling the microarray outputs to a mathematical model involving interferometric analysis (i.e. computationally induced interference mechanism)(col. 6, lines 42-49), as in claim 1.

10. Gulati teaches identifying mutations (i.e. obtaining events of interest) and mapping them to a diseases or conditions to achieve a diagnostic confirmation (i.e. process in a different way than other events and providing event of interest)(col. 8, lines 16-24), as in claim 1.

11. Gulati teaches a computer (i.e. processor) and software(col. 3, lines 29-44), as in claims 1 and 2.

12. Gulati teaches arrayed signal pattern from a biochip (i.e. static data), as in claim 3.

13. Gulati teaches a quantum expressor function (col. 8, lines 25-33), as in claim 4.

14. Gulati teaches a biochip (i.e. a spatial 2-D array and biomolecular platform), as in claims 5 and 6.

15. Gulati teaches exploiting quantum resonators to significantly enhance signal to noise performance (col. 6, lines 57-61), as in claim 8.

16. Gulati teaches applying a dot spectrogram to a quantum expressor function yielding a resonance pattern from which mutation signatures may be identified (col. 8, lines 27-33), as in claim 9.

17. Gualti teach a quantum expressor function (i.e. numeric seuquences), as in claim 10.

18. Gulati teach detection of mutations and quantized hybridization activity (Abstract), as in claim 12.

19. Gulati teach convergent reverberation to yield a resonance pattern (Abstract)(i.e. iterative convergence), as in claim 18.

20. Gulati does not teach converting an input signal from a spatial domain to the spectral domain prior to performing interferometric analysis on the input signal in the spectral domain, as recited in claim 1; the frequency domain, as in claim 17; wave-wave and wave-particle interactions as in claims 16 and 65. Gulati also does not teach constructive and destructive interferometric analysis, as in claims 13 and 64.

21. Cabib et al. however teach interferometric based spectral analysis of objects (Abstract) by collecting signals from pixels using a spectral image which is organized as an intensity function defined in two dimensions (x and y) for an image (i.e. spatial domain)(col. 1, lines 35-46) and applying a Fourier transform to transform the pixel into a spectrum (i.e. spectral domain) (col. 4, lines 33-42; col. 10, lines 5-16), as in claim 1.

22. It is noted that Cabib et al. also teach an “interferogram function" which could also be interpreted as an “expressor function”, as in claim 1.

23. Cabib et al. teach constructive and destructive interference based on the interferometer (col. 22, lines 29-41), as in claims 13 and 64.

24. Cabib et al. teach the frequency domain (col. 22-23, connecting par.), as in claim 17.

25. Cabib et al. teach slit type imaging which samples the intensity of the light which is dispersed by the grating as function of wavelength (i.e. wave-wave interactions), as in claim 16.

26. Cabib et al. spectral imaging which enables measurement of the spectrum of light from every point of an object (i.e. wave-particle interaction)(col. 1, lines 35-37), as in claim 65.

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the interferometric analysis using a quantum expressor function as taught by Gulati with an input signal that had been transformed from the spatial domain to the spectral domain as taught by Cabib et al where in the motivation is that inversion of pixels from the spatial to spectral domain give a spectrum for every pixel which can then be used in interferometric analysis (col. 4, lines 33-42; col. 10, lines 5-16). One of skill in the art would have had a reasonable expectation of success at utilizing the method of Gulati with that of Cabib et al. because Gualti teaches digitized spectral images or “dot spectrum” and Cabib et al. teach pixel images.

Response to Arguments

Applicant's arguments filed 12/04/2009 have been fully considered but they are not persuasive.

Applicants argue that support for the limitation “wherein the input signal is converted from the spatial domain to the spectral domain for the active interferometric analysis,” can be found in parent application 09/253,789 now US Patent 6,136,541 (“’541 patent”). Specifically, Applicants point to Figure 4 in ‘541 patent which depicts the generation of Quantum Expressor Functions through the calculation of harmonic amplitudes for a spin boson system Hamiltonian (items 402 and 404). Applicants argue that this shows that the expressor function is in the spectral domain.

Further Applicants point Figure 2, blocks 202, 208 and 210 which show how a "Designer Nonlinear Quantum Expressor Function” (item 202) is used with "Image Preconditioning" (item 208) to calculate "Resonant Interaction" (item 210). As pointed o by Applicants, col. 17, line 42 to col. 18, line 19 discuss resonance computation in phase space and optionally converting to phase space. As pointed to by Applicants, col. 10 , lines 14-25 discuss Figure 4 wherein harmonic amplitudes for the spin boson system Hamiltonian are calculated. Applicants point to col. 14, line 1 to col. 17, line 28 which describe a series of calculations using “Phase Input” (col. 15, line 1) and a “phase function” (col. 16, lines 51).

The arguments provided by Applicants are not persuasive. Even given that the Quantum Expressor Function, as depicted in Figure 4, relies on a spectral domain due to the Hamiltonian being amplitude dependent, there is no clear teaching in the

specification that an input signal is converted from the spatial domain to the spectral domain. Figure 2 shows that an Expressor Function (item 202) is applied to calculate "resonant interaction" (item 210), however there is no clear teaching that the final Expressor Function (Figure 2 item 202 and Figure 4, item 410) is in the spectral domain and moreover that it has been produced from, or is a result of the **conversion of a signal in the spatial domain into the spectral domain**, as recited.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Skibinsky whose telephone number is (571) 272-4373. The examiner can normally be reached on 8 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anna Skibinsky /AS/

Examiner, Art Unit 1631

/John S. Brusca/

Primary Examiner, Art Unit 1631